

DEPARTMENT OF HEALTH
RADIOACTIVE AIR EMISSIONS
LICENSE AMENDMENT FOR

PROJECT TITLE: TANK WASTE REMEDIATION SYSTEM VADOSE ZONE
CHARACTERIZATION

Date Approved: 26-Feb-02

Emission Unit Name: 200 AREA DIFFUSE/FUGITIVE

This is a MINOR, FUGITIVE, non-point source emission unit.

This emission unit requires the following Abatement Technology:

Applicable Requirements: BARCT

ALARACT [WAC 246-247-040(4)]
BARCT [WAC 246-247-040(3)]

Zone or Area:	Abatement Technology	Required # of Units	Additional Description/Conditions
			Abatement controls as required in the following Conditions and Limitations.

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

This emission unit has the following Monitoring and Sampling Requirements:

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

Regulatory Requirements	Monitoring and Testing Procedure	Radionuclides Requiring Measurement	Sampling Frequency
WAC 246-247-075[3]	Appendix B, Method 114	All radionuclides which could contribute 10% of the potential EDE.	As listed in the following Conditions and Limitations.

Sampling Requirements: Existing near-facility monitoring stations.

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

Change History

- 11/27/01 NOC Revision approved November 27, 2001 to change wording in the NOC. Conditions and Limitations, AIR 02-211, mailed on February 26, 2002.
- 06/21/01 NOC ID 379 obsoleted upon receipt of "Tank Waste Remediation System Vadose Zone Characterization, Revision 2" (DOE/ORP-2000-05) received April 16, 2001, approved via AIR 01-606, June 21, 2001. NOC ID 5 issued to reflect the Conditions and Limitations of operation for this project.
- 03/12/01 NOC IDs 389, 409, 454, 455, 490 combined into NOC ID 379.
- 11/09/00 NOC Revision Form approved on November 9, 2000 and clarified via AIR 00-1104 on November 17, 2000.
- 06/21/00 Vadose Zone NOC Revision Form approved on June 21, 2000.
- 05/26/00 Tank Waste Remediation System Vadose Zone Characterization, Revision 1 (DOE/ORP-2000-05). Approved via AIR 00-515 on May 26, 2000.
- 11/00 Tank Waste Remediation System Vadose Zone Characterization, Revision 0 (DOE/ORP-2000-05). Approved via AIR 00-505.

11/01/99 NOC Revision Form approved on November 1, 1999.

08/23/99 NOC Revision Form approved on August 23, 1999.

14/99 Tank Waste Remediation System Vadose Zone Characterization (DOE/RL-99-34 submitted May 1999).
Approved by AIR 99-701.

CONDITIONS AND LIMITATIONS

- 1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).
- 2) The total abated emission limit for this Notice of Construction is limited to 7.03E-02 mrem/year to the Maximally Exposed Individual. The total unabated emission limit for this Notice of Construction is limited to 7.03E-02 mrem/year to the Maximally Exposed Individual.
- 3) **This process is limited to:**
subsurface soil sampling within selected single-shell tank farms. Several methods of sampling and drilling techniques are approved, including air rotary drilling, sonic drilling, closed-end probe, cable tool drilling, cone penetrometer, air rotary split spoon, and others. This approval applies only to the following tank farms: 241-A, 241-AX, 241-B, 241-BX, 241-BY, 241-C, 241-S, 241-SX, 241-T, 241-TX, 241-TY and 241-U.

Up to ten equivalent boreholes may be drilled or re-entered per year (consecutive 12-month period) by the methods described. An equivalent borehole shall have a nominal top diameter of no larger than ten inches for the first 50 feet, and a nominal bottom diameter of no larger than eight inches for the remaining 200 feet of pipe (average depth is 250 feet). Additionally, an equivalent borehole shall contain a contaminated layer no more than 20 feet long in the ten inch portion of the equivalent borehole. Individual methods shall be selected based on the likely level (concentration) of contaminants to be encountered. The most conservative drilling approach (lowest potential-to-emit) shall be applied first. Borehole logging shall be used to determine when it is appropriate to apply drilling techniques that may have a higher potential-to-emit. Zones not sampled during advancement of the borehole due to having a high potential to exceed exposure guidelines may be sampled by various side-wall sampling techniques as the boreholes are decommissioned.

Samples from air rotary type drilling shall be obtained from the "sampling sock" located on the side of the cyclone and/or from the drums underneath the cyclone and torit. The material in the drums will be sampled by pulling a mini-core from the drum. Sampling and change-out of the drums shall be performed inside the containment structure with continuous health physics technician (HPT) coverage.

Other possible borehole drilling techniques that may be used are limited to those described below:

- Sonic drilling
- Closed-end probe
- Traditional cable tool drilling from top to bottom
- Cone Penetrometer
- Geo Probe
- Auger drilling

Other soil sampling techniques will include one or a combination of the following techniques:

- Air Rotary Split Spoon
- Cable Tool
- Cable Tool and Auger with a Split Spoon Core Barrel
- Sonic Core Barrel and Split Spoon
- Rotary Coring
- Sidewall Sampling
- Drive Split-Spoon Sampler

Sidewall samples being brought to the surface will be bagged or sleeved into plastic or other suitable container (e.g. shielded container) after retrieval if decontamination or application of fixatives cannot reduce smearable contamination to less than 100,000 disintegrations per minute (dpm) per 100 cm² for beta/gamma or 2,000 dpm/100 cm² for alpha. The sampler will then be packaged in a container suitable for shipment to the laboratory for analysis. Other sidewall sampling techniques may involve a lever-action sampler (the sampler is driven into the formation through a cantilever action) or a rotating formation "shaving" device with the sample captured in an under-slung basket.

The brush, used to clean casings, shall be placed in plastic sleeving if decontamination or application of fixatives cannot reduce smearable contamination to less than 100,000 dpm/100 cm² for beta/gamma or 2,000 dpm/100 cm² for alpha when it is removed from the borehole. Pull the casing into plastic sleeving during removal if decontamination or application of fixatives cannot reduce smearable contamination to less than 100,000 dpm/100 cm² for beta/gamma or 2,000 dpm/100 cm² for alpha. Unthread the casing if possible, or cut using a wheel cutter, or disconnected from other segments into a nominal length of ten feet. A high-speed blade wheel cutter is not allowed. When necessary, either to accomplish casing removal for borehole decommissioning or to enable pull-back for sidewall sampling, the casing will be cut at depth using a Bowen casing cutter (or equivalent). If decontamination or application of fixatives cannot reduce smearable contamination to less than 100,000 dpm/100 cm² for beta/gamma or 2,000 dpm/100 cm² for alpha and the casing is sleeved in plastic, no more than one foot of casing shall be exposed to air during the cutting process. Capture cuttings in draped plastic. If decontamination or application of fixatives cannot reduce smearable contamination to less than 100,000 dpm/100 cm² for beta/gamma or 2,000 dpm/100 cm² for alpha, cap the pieces, cut with plastic or horsetail the sleeving and place sections in a burial box. The hole will be backfilled with clean (nonradioactive) materials (e.g., granular bentonite and/or grout). Casing removal activities are allowed to be performed outside of the containment structure. The closure of the equivalent boreholes may also be performed by backfilling the borehole using a tremie without pulling the casing.

Collect any perched water in the drum at the bottom of the cyclone. Approximately 1,000 gallons of purgewater is allowed to be removed from each equivalent borehole prior to inserting a screen below the water table. After installation of the screen, groundwater samples will be taken. An average of 2,000 gallons of water (which includes perched water, purgewater and groundwater sampling) is allowed to be removed from each equivalent borehole. Perched water and purgewater will be collected in passively ventilated open-top containers. Water shall be transferred from the passively ventilated containers into a tanker truck for treatment at the 200 Area Effluent Treatment Facility or other permitted storage/treatment facility. Water may be transferred directly from the borehole to the tanker truck, bypassing the intermediate containers.

Approximately 3,500 ft³ of soil may be excavated per year. Perform excavation using manual methods, backhoe, and/or the Guzzler.

- 4) The Annual Possession Quantity is limited to the following radionuclides (Curies/year):

Ac	227	4.55E-04
Am	241	3.48E+01
Am	243	7.75E-04
C-	14	2.13E-01
Cm	242	2.72E-01
Cm	243	9.47E-03
Cm	244	8.83E-02
Co	60	9.66E-01
Cs	134	1.48E-02
Cs	137	1.85E+03
Eu	152	4.13E-01
Eu	154	8.67E+00
Eu	155	2.61E+01
H-	3	7.68E-01
I-	129	1.72E-02
Ni	59	5.13E-01
Ni	63	4.99E+01
Np	237	3.55E-03
Pa	231	4.72E-04
Pu	238	2.20E+00
Pu	239	2.00E+02
Pu	240	2.11E+01
Pu	241	1.25E+02
Pu	242	5.98E-04
Ra	226	3.69E-05
Ra	228	1.92E-03
Ru	106	1.71E-03
Sb	125	7.25E-01
Sm	151	1.86E+02
Sn	126	7.97E-02
Sr	90	2.07E+04
Tc	99	3.55E+00
Th	229	7.76E-05
Th	232	7.60E-05
U-	232	5.87E-03
U-	233	2.25E-02
U-	234	4.45E-01
U-	235	1.97E-02
U-	236	4.55E-03
U-	238	4.48E-01
Y-	90	2.07E+04
Zr	93	2.41E-01

- 5) These Conditions and Limitations must be proceduralized prior to starting the activities described in the Notice of Construction.
- 6) U.S. DOE shall monitor this project or emission unit as follows: fugitive emissions result from cable

tool and sonic drilling, use of the closed end probe and the cone penetrometer, the plastic containment structure during air rotary drilling, and during dismantlement/assembly or relocating the ventilation equipment, plastic containment structure, or process equipment. To confirm low emissions, periodic confirmatory monitoring will be accomplished by operating three fixed head samplers around the location of where the drilling and sampling operations are occurring. The fixed head samplers will be located within 100 feet of where the drilling and sampling work activities are occurring and will be operated whenever the work activities have the potential-to-emit radionuclides. These samples shall be composited for each three individual sites (total of three samples) and analyzed at the end of each borehole. Packaging of equipment and samples for shipment, shall have surveys (swipes for removable contamination) performed in accordance with TWRS as low as reasonably achievable control technology (ALARACT) demonstration number 12 and subsequent revisions, "TWRS ALARACT Demonstration for Packaging and Transportation of Equipment & Vehicles".

Fugitive emissions may also result from removing casing from the ground. To confirm low emissions, periodic confirmatory monitoring will be accomplished by operating three fixed head samplers around the location of the work activities. The fixed head samplers shall also be located with 100 feet of where the casing removal activities are occurring and shall be operated when the work activities have the potential-to-emit radionuclides. These samples shall be composited for each three individual sites (total of three samples) and analyzed at the end of each casing removal (WAC 246-247-075(8)).

- 7) This NOC becomes obsolete on July 15, 2019.
- 8) The facility shall notify the department at least seven days prior to any planned preoperational testing of the emission unit's emissions control, monitoring or containment systems. The department reserves the right to observe such tests (WAC 246-247-060(4)).
- 9) The department retains the right to conduct its own stack sampling, environmental monitoring or other testing, as required around this unit to assure compliance. If the department so decides, the facility must make provision for such testing (WAC 246-247-075(10) and (11)).
- 10) The facility must be able to demonstrate the reliability and accuracy of emission data and other test results from this unit (WAC 246-247-075(13) and WAC 246-247-075(6)). The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards listed in, or equivalent to, those listed in the above cited regulation.
- 11) If there is an unexpected release of radioactivity or if there is a shutdown or other condition that, if it were allowed to persist, would result in emissions of radionuclides in excess of any standards or limitations in the license or that lasts more than four hours, it must be reported to the department within 24 hours. Applicable standards (WAC 246-247-040) include unit specific emission limits, the offsite dose standard, BARCT or ALARACT, whichever is applicable, or any limitations included in this approval.
- 12) The department reserves the right to inspect and audit this unit during construction and operation, including all activities, equipment, operations, documents, data, and other records related to compliance with the regulations (WAC 246-247-080 (1)).
- 13) The facility shall make requested documents available in a timely manner for review (WAC 246-247-080(10)).
- 14) **This condition was obsoleted on 2/25/02.** When this project is completed, or operations cease, the facility shall notify the department via a report of closure, including whether or not any potential for airborne release occur (WAC 246-247-080(6)).

Condition/Limitation added via AIR 99-701, July 7, 1999. Obsoleted to reflect current sunset language via AIR 02-211.

- 15) All measured or calculated emissions must be reported annually in the Hanford Site Air Emissions

Report (WAC 246-247-080(3)).

- 16) All reports and records must be kept and reported according to 40 CFR 61, Subpart H. (WAC 246-247-080(2)).
- 17) This unit must be fully accessible to Department of Health inspectors. If there are any specific training requirements or have restrictions or special requirements for entry, they must be given to the department when they are known to allow for unannounced inspections, as required by EPA (WAC 246-247-080(9)). At a minimum, for unannounced inspections, such requirements or restrictions must be told to inspectors that morning, with the opportunity for the inspectors to meet those requirements. For prior announced inspections, such notification must occur far enough in advance for the inspectors to have reasonable time to meet the requirements.
- 18) Records must be readily (promptly) available for this unit. Those records must be maintained onsite, and must be retained for at least five years (WAC 246-247-080 (8)).
- 19) The facility must maintain a log in an approved format for this activity or emission unit (WAC 246-247-080(7)).
- 20) The department may require an ALARACT demonstration at any time (WAC 246-247-080(1)).
- 21) Emissions for these activities shall be tracked via a log approved by the department. This log shall track the hours of operation and location of use for each type of equipment, estimated and calculated curies encountered, and calculated emissions. Air samples used for periodic confirmatory measurement shall be collected no closer than three feet above ground level. These samples shall be composited for each three individual sites (total of three samples) and analyzed at the completion of the borehole or re-entry activity and casing removal. All periodic confirmatory samples will be collected and analyzed following EPA Method 114.
- 22) The facility must be able to demonstrate that the workers associated with this emission unit are adequately trained in the use and maintenance of emission control and monitoring systems, and in the performance of associated test and emergency response procedures (WAC 246-247-075(12)).
- 23) The following controls shall be mandatory when handling perched water, ground water and ground water sampling. All contaminated liquids shall be contained; all exterior surfaces of liquid holding devices shall be maintained at the current radiological free release limit; vented drums shall be maintained non-smearable; storage and handling of the vented drums shall be as described in the Site Wide Vented Drum Notice of Construction.
- 24) No more than an average of 2,000 gallons of water (includes perched water, purge water and groundwater sampling) will be removed from each equivalent bore hole. Not to exceed 20,000 gal/year of water. Perched water and purge water will be collected in passively ventilated open top containers. When a sufficient volume of water has been collected or at the end of groundwater sampling activities, the water shall be transferred from the passively ventilated containers into a tanker truck for treatment at the 200 Area ETF or other permitted storage/treatment facility.
- 25) If the department finds that the emission unit described in this NOC is not in compliance with the standards in WAC 246-247-040 during construction or during operation the department reserves the right to require modifications to bring it into compliance (WAC 246-247-060(2)(d)).
- 26) The following additional drilling techniques are approved for use: geoprobe and auger drilling. For casing removal or to enable pull back for sidewall sampling, the casing may be cut at depth using a Bowen Casing Cutter (or equivalent with prior DOH approval).
- 27) Approval is given as an alternative to transfer the perched water directly from borehole to the tanker.
- 28) For various characterization options covered under this NOC, the maximum TEDE to the hypothetical

off site MEI shall not exceed 7.03 E-02 mrem/year. The maximum TEDE to the MEI shall not exceed 5.7 E-02 mrem/year at the Energy Northwest location as determined by CAP88PC, Version 2 supplied as supporting documentation.

- 29) No more than 3,500 cubic feet of soil may be excavated per year using manual methods, backhoe, and/or the guzzler. This shall be documented on an approved log.
- 30) U.S. DOE shall provide additional monitoring as follows: Fugitive emissions result from excavations using hand tools shall be described as described in TWRS ALARCT 5. Fugitive emissions that result from excavations using backhoe shall consist of the following:
- a) HPT coverage will be performed as specified in the radiological permit.
 - b) A beta-gamma survey of the ground surface is required prior to excavation in Contamination Areas (CA's), High Contamination Areas (HCA's), Soil Contamination Areas (SCA's), and Underground Radioactive Materials Areas (URMA's). An alpha survey may be required prior to excavation per the "Justification for Dual Survey Exemption in Tank Farm Facilities" HNF-3391.
 - c) For excavations in CA's, HCA's, SCA's, and URMA's, if beta-gamma activity greater than 1000 dpm/probe area (5000 dpm/100 cm²) is identified, alpha surveys will also be performed.
 - d) Suppressants such as water, fixatives, covers, or windscreens will be used as necessary, including at the end of each shift or when sustained or predicted winds are >20 mph. Excavations are not allowed when sustained or predicted winds will be >20mph.
 - e) If the net alpha for the general area is greater than 140 dpm/probe area, OR if the net beta-gamma activity for the general area is greater than 500,000 dpm/probe area, work will be suspended and worker safety evaluated by radiological control. Direct contact will also be made to WDOH. After it is determined that there is no threat to worker safety, WDOH has been contacted, and the proper controls (e.g., water fixatives, covers, windscreens) have been put in place, excavation may continue. A contact of WDOH will not be needed if the contamination consists of a hot speck. If hot specks are detected during the radiological surveys, the speck will be removed and contained before the activity is allowed to continue unless located in the bottom of the trench after excavation has been completed. Specks found in the bottom of the completed trench may be covered with clean fill. A hot speck will be defined as a very small amount (i.e., less than or equal to 100 cm²) of contamination reading greater than or equal to 1,000,000 dpm/probe size beta-gamma and/or greater than or equal to 490 dpm/probe size alpha.
- 31) Excavations using the Guzzler shall follow the Conditions and Limitations for approval for the Categorical NOC for use of the Guzzler on the Hanford Site. All source term work performed under this activity shall be tracked against this APQ.
- 32) Casing size reduction may also be by unthreading.
- 33) Drive Split Spoon Sampler will be included as a soil sampling technique.
- 34) The APQ associated with perch water, purgewater and groundwater sampling shall not exceed 7.57 E-03 curies. The APQ associated with excavation shall not exceed 74.9 curies. These shall be tracked and documented on an approved log.
- 35) Emission controls to be used during sonic drilling, cable tool drilling, during use of the cone penetrometer, use of the closed-end probe, and casing removal will be decontamination by nonaggressive manual methods such as wiping, sleeving into plastic or having fixatives applied to prevent the spread of contamination if the smearable contamination levels are greater than 100,000 dpm/100 cm² for beta/gamma or 2,000 dpm/100 cm² for alpha.
- As the core barrel is removed from the ground during cable tool drilling, a smear survey will be taken of the core barrel. Decontamination activities will be performed as needed to reduce smearable contamination.
- a. At selected depths, samples will be taken and these samples will be removed from the core barrel prior to striking the exterior of the core barrel with a hammer or hard object to dislodge soil into a

plastic lined drum. There will be minimal potential for emissions from striking the core barrel to dislodge the soil into the drum.

b. When the smearable contamination level is greater than 100,000 dpm/100 cm² for beta/gamma or 2,000 dpm/100 cm² for alpha, the core barrel will be sleeved in plastic. The core barrel will be removed from the drill string and placed in a suitable closed container for shipment to the laboratory or placed in a plastic-lined drum.

Additionally, other sample containers may be wrapped in plastic after retrieval and the casing may be sleeved into plastic during the removal process to prevent the spread of contamination.

- 36) Prior to permanent shut down of an emission unit or completion of an activity, the permittee shall file a report of closure with the Department of Health. The report of closure shall include the date of the shutdown and indicate whether, despite cessation of operation, there is still a potential for radioactive air emissions and a need for any active or passive ventilation system with emission control and/or monitoring devices. An emission unit or activity will not be considered permanently shut down or completed until a report of closure is received and approved by Health.

Once an emission unit is permanently shut down or an activity is completed, thereby rendering existing permit terms and conditions irrelevant, the permittee shall not be required, after the shutdown or completion, to meet any monitoring, record keeping, and reporting, requirements which are no longer applicable for that emission unit or activity.

All records, relating to the shut down emission unit or completion of an activity, generated while the emission unit or activity was in operation, shall be kept in accordance with WAC 246-247-080 (8).
(WAC 246-247-080 (6))

DEPARTMENT OF HEALTH
RADIOACTIVE AIR EMISSIONS
LICENSE AMENDMENT FOR

**PROJECT TITLE: TANK WASTE REMEDIATION SYSTEM VADOSE ZONE
CHARACTERIZATION**

Date Approved: 26-Feb-02

Emission Unit Name: AIR ROTARY DRILLING

This is a MINOR, ACTIVELY ventilated emission unit.

This emission unit requires the following Abatement Technology:

Applicable Requirements: BARCT

ALARACT [WAC 246-247-040(4)]
BARCT [WAC 246-247-040(3)]

Zone or Area:	Abatement Technology	Required # of Units	Additional Description/Conditions
	HEPA	1	On the containment structure.
	HEPA	1	On the Air Rotary Exhaust.
	HEPA	1	To be used as a record filter on the Air Rotary Exhaust.

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

This emission unit has the following Monitoring and Sampling Requirements:

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

Regulatory Requirements	Monitoring and Testing Procedure	Radionuclides Requiring Measurement	Sampling Frequency
40 CFR 61.93(b)(4)(i) & WAC 246-247-075(3)	Appendix B, Method 114(3)	All radionuclides which could contribute 10% of the potential EDE.	The record filter is to be counted annually (either a destructive or non-destructive technique) using a gamma spectrometer calibrated to Cs-137.

Sampling Requirements: Destructive or non-destructive analysis of the record filter combined with field surveys.

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

Change History

- 11/27/01 NOC Revision approved November 27, 2001 to change wording in the NOC. Conditions and Limitations, AIR 02-211, mailed on February 26, 2002.
- 06/21/01 NOC ID 379 obsoleted upon receipt of "Tank Waste Remediation System Vadose Zone Characterization, Revision 2" (DOE/ORP-2000-05) received April 16, 2001, approved via AIR 01-606, June 21, 2001. NOC ID 5 issued to reflect the Conditions and Limitations of operation for this project.
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- 05/26/00 Tank Waste Remediation System Vadose Zone Characterization, Revision 1 (DOE/ORP-2000-05).

- 05/11/00 Tank Waste Remediation System Vadose Zone Characterization, Revision 0 (DOE/ORP-2000-05).
Approved via AIR 00-505.
- 1/99 NOC Revision Form approved on November 1, 1999.
- 08/23/99 NOC Revision Form approved on August 23, 1999.
- 07/14/99 Tank Waste Remediation System Vadose Zone Characterization (DOE/RL-99-34 submitted May 1999).
Approved by AIR 99-701.

CONDITIONS AND LIMITATIONS

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- 2) The total abated emission limit for this Notice of Construction is limited to 7.03E-02 mrem/year to the Maximally Exposed Individual. The total unabated emission limit for this Notice of Construction is limited to 7.03E-02 mrem/year to the Maximally Exposed Individual.
- 3) **This process is limited to:**
subsurface soil sampling within selected single-shell tank farms. Several methods of sampling and drilling techniques are approved, including air rotary drilling, sonic drilling, closed-end probe, cable tool drilling, cone penetrometer, air rotary split spoon, and others. This approval applies only to the following tank farms: 241-A, 241-AX, 241-B, 241-BX, 241-BY, 241-C, 241-S, 241-SX, 241-T, 241-TX, 241-TY and 241-U.

Up to ten equivalent boreholes may be drilled or re-entered per year (consecutive 12-month period) by the methods described. An equivalent borehole shall have a nominal top diameter of no larger than ten inches for the first 50 feet, and a nominal bottom diameter of no larger than eight inches for the remaining 200 feet of pipe (average depth is 250 feet). Additionally, an equivalent borehole shall contain a contaminated layer no more than 20 feet long in the ten inch portion of the equivalent borehole. Individual methods shall be selected based on the likely level (concentration) of contaminants to be encountered. The most conservative drilling approach (lowest potential-to-emit) shall be applied first. Borehole logging shall be used to determine when it is appropriate to apply drilling techniques that may have a higher potential-to-emit. Zones not sampled during advancement of the borehole due to having a high potential to exceed exposure guidelines may be sampled by various side-wall sampling techniques as the boreholes are decommissioned.

Samples from air rotary type drilling shall be obtained from the "sampling sock" located on the side of the cyclone and/or from the drums underneath the cyclone and torit. The material in the drums will be sampled by pulling a mini-core from the drum. Sampling and change-out of the drums shall be performed inside the containment structure with continuous health physics technician (HPT) coverage.

Other possible borehole drilling techniques that may be used are limited to those described below:

- Sonic drilling
- Closed-end probe
- Traditional cable tool drilling from top to bottom
- Cone Penetrometer
- Geo Probe

- Auger drilling

Other soil sampling techniques will include one or a combination of the following techniques:

- Air Rotary Split Spoon
- Cable Tool
- Cable Tool and Auger with a Split Spoon Core Barrel
- Sonic Core Barrel and Split Spoon
- Rotary Coring
- Sidewall Sampling
- Drive Split-Spoon Sampler

Sidewall samples being brought to the surface will be bagged or sleeved into plastic or other suitable container (e.g. shielded container) after retrieval if decontamination or application of fixatives cannot reduce smearable contamination to less than 100,000 disintegrations per minute (dpm) per 100 cm² for beta/gamma or 2,000 dpm/100 cm² for alpha. The sampler will then be packaged in a container suitable for shipment to the laboratory for analysis. Other sidewall sampling techniques may involve a lever-action sampler (the sampler is driven into the formation through a cantilever action) or a rotating formation "shaving" device with the sample captured in an under-slung basket.

The brush, used to clean casings, shall be placed in plastic sleeving if decontamination or application of fixatives cannot reduce smearable contamination to less than 100,000 dpm/100 cm² for beta/gamma or 2,000 dpm/100 cm² for alpha when it is removed from the borehole. Pull the casing into plastic sleeving during removal if decontamination or application of fixatives cannot reduce smearable contamination to less than 100,000 dpm/100 cm² for beta/gamma or 2,000 dpm/100 cm² for alpha. Unthread the casing if possible, or cut using a wheel cutter, or disconnected from other segments into a nominal length of ten feet. A high-speed blade wheel cutter is not allowed. When necessary, either to accomplish casing removal for borehole decommissioning or to enable pull-back for sidewall sampling, the casing will be cut at depth using a Bowen casing cutter (or equivalent). If decontamination or application of fixatives cannot reduce smearable contamination to less than 100,000 dpm/100 cm² for beta/gamma or 2,000 dpm/100 cm² for alpha and the casing is sleeved in plastic, no more than one foot of casing shall be exposed to air during the cutting process. Capture cuttings in draped plastic. If decontamination or application of fixatives cannot reduce smearable contamination to less than 100,000 dpm/100 cm² for beta/gamma or 2,000 dpm/100 cm² for alpha, cap the pieces, cut with plastic or horsetail the sleeving and place sections in a burial box. The hole will be backfilled with clean (nonradioactive) materials (e.g., granular bentonite and/or grout). Casing removal activities are allowed to be performed outside of the containment structure. The closure of the equivalent boreholes may also be performed by backfilling the borehole using a tremie without pulling the casing.

Collect any perched water in the drum at the bottom of the cyclone. Approximately 1,000 gallons of purgewater is allowed to be removed from each equivalent borehole prior to inserting a screen below the water table. After installation of the screen, groundwater samples will be taken. An average of 2,000 gallons of water (which includes perched water, purgewater and groundwater sampling) is allowed to be removed from each equivalent borehole. Perched water and purgewater will be collected in passively ventilated open-top containers. Water shall be transferred from the passively ventilated containers into a tanker truck for treatment at the 200 Area Effluent Treatment Facility or other permitted storage/treatment facility. Water may be transferred directly from the borehole to the tanker truck, bypassing the intermediate containers.

Approximately 3,500 ft³ of soil may be excavated per year. Perform excavation using manual

methods, backhoe, and/or the Guzzler.

4) The Annual Possession Quantity is limited to the following radionuclides (Curies/year):

Ac	227	6.82E-09
Am	241	5.22E-04
Am	243	1.16E-08
C-	14	3.19E-06
Cm	242	4.08E-06
Cm	243	1.42E-07
Cm	244	1.32E-06
Co	60	1.45E-05
Cs	134	2.22E-07
Cs	137	2.77E-02
Eu	152	6.19E-06
Eu	154	1.30E-04
Eu	155	3.91E-04
H-	3	1.15E-05
I-	129	2.58E-07
Ni	59	7.69E-06
Ni	63	7.48E-04
Np	237	5.32E-08
Pa	231	7.08E-09
Pu	238	3.29E-05
Pu	239	3.00E-03
Pu	240	3.17E-04
Pu	241	1.87E-03
Pu	242	8.97E-09
Ra	226	5.53E-10
Ra	228	2.87E-08
Ru	106	2.56E-08
Sb	125	1.09E-05
Sm	151	2.79E-03
Sn	126	1.19E-06
Sr	90	3.10E-01
Tc	99	5.33E-05
Th	229	1.16E-09
Th	232	1.14E-09
U-	232	8.79E-08
U-	233	3.38E-07
U-	234	6.67E-06
U-	235	2.95E-07
U-	236	6.82E-08
U-	238	6.72E-06
Y-	90	3.10E-01
Zr	93	3.61E-06

5) These Conditions and Limitations must be proceduralized prior to starting the activities described in the

Notice of Construction.

- 6) This NOC becomes obsolete on July 15, 2019.
- 7) The facility shall notify the department at least seven days prior to any planned preoperational testing of the emission unit's emissions control, monitoring or containment systems. The department reserves the right to observe such tests (WAC 246-47-060(4)).
- 8) The department retains the right to conduct its own stack sampling, environmental monitoring or other testing, as required around this unit to assure compliance. If the department so decides, the facility must make provision for such testing (WAC 246-247-075(10) and (11)).
- 9) The facility must be able to demonstrate the reliability and accuracy of emission data and other test results from this unit (WAC 246-247-075(13) and WAC 246-247-075(6)). The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards listed in, or equivalent to, those listed in the above cited regulation.
- 10) If there is an unexpected release of radioactivity or if there is a shutdown or other condition that, if it were allowed to persist, would result in emissions of radionuclides in excess of any standards or limitations in the license or that lasts more than four hours, it must be reported to the department within 24 hours. Applicable standards (WAC 246-247-040) include unit specific emission limits, the offsite dose standard, BARCT or ALARACT, whichever is applicable, or any limitations included in this approval.
- 11) The department reserves the right to inspect and audit this unit during construction and operation, including all activities, equipment, operations, documents, data, and other records related to compliance with the regulations (WAC 246-247-080 (1)).
- 12) The facility shall make requested documents available in a timely manner for review (WAC 246-247-080(10)).
- 13) **This condition was obsoleted on 2/25/02.** When this project is completed, or operations cease, the facility shall notify the department via a report of closure, including whether or not any potential for airborne release occur (WAC 246-247-080(6)).
Condition/Limitation added via AIR 99-701, July 7, 1999. Obsoleted to reflect current sunset language via AIR 02-211.
- 14) All measured or calculated emissions must be reported annually in the Hanford Site Air Emissions Report (WAC 246-247-080(3)).
- 15) Periodic confirmatory sampling is required. For the air rotary type drilling this shall consist of a destructive or non-destructive analysis of the record filter combined with radiological field surveys during the work. The record HEPA type filter located downstream shall have a minimum efficiency of 90 percent for particulates with a median diameter of 0.3 microns as specified by the manufacturer. The radiological analyses from the soil samples will be averaged to determine the isotopic distribution of Strontium-90 (Sr-90), Cesium-137 (Cs-137), Plutonium-239 (Pu-239) and Americium (Am-241). The record filter will be counted using a gamma spectrometer calibrated to Cs-137. Counting will be done annually using either a destructive or non-destructive technique.

The soil sample isotope ratios will be applied to Cs-137 on the record filter to confirm low emissions. In addition, the HEPA filter housing shall be field surveyed after the completion of each borehole or re-entry to verify low emissions. Periodic confirmatory monitoring of the passive HEPA type filter will be accomplished by performing a field survey of the filter housing to confirm low emissions. The field survey of the passive HEPA type filter will be performed after the completion of each borehole or re-entry. These methods of performing these "field surveys" shall be submitted to the department for approval (WAC 246-247-075(3)).

- 16) All reports and records must be kept and reported according to 40 CFR 61, Subpart H (WAC 246-247-080(2)).
- 17) This unit must be fully accessible to Department of Health inspectors. If there are any specific training requirements or have restrictions or special requirements for entry, they must be given to the department when they are known to allow for unannounced inspections, as required by EPA (WAC 246-247-080(9)). At a minimum, for unannounced inspections, such requirements or restrictions must be told to inspectors that morning, with the opportunity for the inspectors to meet those requirements. For prior announced inspections, such notification must occur far enough in advance for the inspectors to have reasonable time to meet the requirements.
- 18) Records must be readily (promptly) available for this unit. Those records must be maintained onsite, and must be retained for at least five years (WAC 246-247-080(8)).
- 19) The facility must maintain a log in an approved format for this activity or emission unit (WAC 246-247-080(7)).
- 20) The department may require an ALARACT demonstration at any time (WAC 246-247-080(1)).
- 21) Emissions for these activities shall be tracked via a log approved by the department. This log shall track the hours of operation and location of use for each type of equipment, estimated and calculated curies encountered, and calculated emissions. Air samples used for periodic confirmatory measurement shall be collected no closer than three feet above ground level. These samples shall be composited for each three individual sites (total of three samples) and analyzed at the completion of the borehole activity and casing removal. All periodic confirmatory samples will be collected and analyzed following EPA Method 114.
- 22) The facility must be able to demonstrate that the workers associated with this emission unit are adequately trained in the use and maintenance of emission control and monitoring systems, and in the performance of associated test and emergency response procedures (WAC 246-247-075(12)).
- 23) If the department finds that the emission unit described in this NOC is not in compliance with the standards in WAC 246-247-040 during construction or during operation the department reserves the right to require modifications to bring it into compliance (WAC 246-247-060(2)(d)).
- 24) For various characterization options covered under this NOC, the maximum TEDE to the hypothetical off site MEI shall not exceed 7.03 E-02 mrem/year. The maximum TEDE to the MEI shall not exceed 5.7 E-02 mrem/year at the Energy Northwest location as determined by CAP88PC, Version 2 supplied as supporting documentation.
- 25) Emissions from air rotary drilling activities shall be contained using an active ventilation system attached to the process equipment and a passive vent system attached to the process equipment containment structure. The active ventilation system shall have radioactive air emissions abated by one stage of high efficiency particulate air (HEPA) filter. The HEPA filter shall be tested to provide a minimum collection efficiency of 99.95 percent for particulates with a median diameter of 0.3 microns. The containment structure shall have a passive HEPA type filter that will provide high efficiency collection. The exhaust fan shall have a maximum average velocity of 0.85 cubic meters per second (1,800 cubic feet per minute) with a range of 0.6 to 1.2 cubic meters per second (1,200 to 2,400 cubic feet per minute) to maintain the ducting between the cyclone and the HEPA filter at atmospheric or less than atmospheric pressure. The drill rig shall be sealed to the casing so that particulates will be contained and routed to the process equipment (e.g., cyclone and torit) located inside the plastic containment structure. The flange on the well discharge head and on the inlet of the cyclone shall be double flanged to reduce the potential for an unabated release to the atmosphere. Additionally, the flexible line connecting the well discharge head and the cyclone shall be encased by another flexible line. The flexible encasement line and flanges shall also be vented to the cyclone. The plastic

containment structure surrounding the process control equipment shall be fitted with one stage of HEPA type filtration. When the borehole or re-entry has been completed and the process equipment is ready to be removed, equipment shall be broken down at the disconnect points and contaminated equipment openings shall be sealed or plugged to minimize the spread of contamination. All work related to disconnecting and moving the equipment shall be performed in accordance with TWRS as low as reasonably achievable control technology (ALARACT) demonstration number 12 or subsequent revision ALARACT "Demonstration for Packaging and Transportation of Equipment and Vehicles".

- 26) APQ associated with the air rotary drilling shall be tracked and documented on an approved log and subtracted from the APQ listed for the emissions associated with diffuse and fugitive emissions.
- 27) Prior to permanent shut down of an emission unit or completion of an activity, the permittee shall file a report of closure with the Department of Health. The report of closure shall include the date of the shutdown and indicate whether, despite cessation of operation, there is still a potential for radioactive air emissions and a need for any active or passive ventilation system with emission control and/or monitoring devices. An emission unit or activity will not be considered permanently shut down or completed until a report of closure is received and approved by Health.

Once an emission unit is permanently shut down or an activity is completed, thereby rendering existing permit terms and conditions irrelevant, the permittee shall not be required, after the shutdown or completion, to meet any monitoring, record keeping, and reporting, requirements which are no longer applicable for that emission unit or activity.

All records, relating to the shut down emission unit or completion of an activity, generated while the emission unit or activity was in operation, shall be kept in accordance with WAC 246-247-080 (8).
(WAC 246-247-080 (6))

DEPARTMENT OF HEALTH
RADIOACTIVE AIR EMISSIONS
LICENSE AMENDMENT FOR

**PROJECT TITLE: TANK WASTE REMEDIATION SYSTEM VADOSE ZONE
CHARACTERIZATION**

Date Approved: 26-Feb-02

Emission Unit Name: AIR HAMMER DRILLING

This is a MINOR, ACTIVELY ventilated emission unit.

This emission unit requires the following Abatement Technology:

Applicable Requirements: BARCT

ALARACT [WAC 246-247-040(4)]
BARCT [WAC 246-247-040(3)]

Zone or Area:	Abatement Technology	Required # of Units	Additional Description/Conditions
	HEPA	1	The HEPA filter may or may not have an exhaust fan associated with it.

Additional abatement technologies required by this Notice of Construction will be listed in the Conditions and Limitations section.

This emission unit has the following Monitoring and Sampling Requirements:

Applicable Requirements: Monitoring, Testing and Quality Assurance WAC 246-247-075

Regulatory Requirements	Monitoring and Testing Procedure	Radionuclides Requiring Measurement	Sampling Frequency
40 CFR 61.93(b)(4)(i) & WAC 246-247-075(3)	Appendix B, Method 114(3)	All radionuclides which could contribute 10% of the potential EDE.	

Sampling Requirements: For passive HEPA filter, perform field survey of the filter housing after each borehole.

Additional monitoring or sampling requirements established by this NOC will be listed in the Conditions and Limitations section.

Change History

- 11/27/01 NOC Revision approved November 27, 2001 to change wording in the NOC. Conditions and Limitations, AIR 02-211, mailed on February 26, 2002.
- 06/21/01 NOC ID 379 obsoleted upon receipt of "Tank Waste Remediation System Vadose Zone Characterization, Revision 2" (DOE/ORP-2000-05) received April 16, 2001, approved via AIR 01-606, June 21, 2001. NOC ID 5 issued to reflect the Conditions and Limitations of operation for this project.
- 03/12/01 NOC IDs 389, 409, 454, 455, 490 combined into NOC ID 379.
- 11/09/00 NOC Revision Form approved on November 9, 2000 and clarified via AIR 00-1104 on November 17, 2000.
- 06/21/00 Vadose Zone NOC Revision Form approved on June 21, 2000.
- 05/26/00 Tank Waste Remediation System Vadose Zone Characterization, Revision 1 (DOE/ORP-2000-05). Approved via AIR 00-515 on May 26, 2000.
- 5/11/00 Tank Waste Remediation System Vadose Zone Characterization, Revision 0 (DOE/ORP-2000-05). Approved via AIR 00-505.

11/01/99 NOC Revision Form approved on November 1, 1999.

08/23/99 NOC Revision Form approved on August 23, 1999.

01/14/99 Tank Waste Remediation System Vadose Zone Characterization (DOE/RL-99-34 submitted May 1999).
Approved by AIR 99-701.

CONDITIONS AND LIMITATIONS

- 1) The U.S. Department of Energy shall comply with all Conditions and Limitations of this license (WAC 246-247-060(5)).
- 2) The total abated emission limit for this Notice of Construction is limited to $7.03E-02$ mrem/year to the Maximally Exposed Individual. The total unabated emission limit for this Notice of Construction is limited to $7.03E-02$ mrem/year to the Maximally Exposed Individual.
- 3) **This process is limited to:**
subsurface soil sampling within selected single-shell tank farms. Several methods of sampling and drilling techniques are approved, including air rotary drilling, sonic drilling, closed-end probe, cable tool drilling, cone penetrometer, air rotary split spoon, and others. This approval applies only to the following tank farms: 241-A, 241-AX, 241-B, 241-BX, 241-BY, 241-C, 241-S, 241-SX, 241-T, 241-TX, 241-TY and 241-U.

Up to ten equivalent boreholes may be drilled or re-entered per year (consecutive 12-month period) by the methods described. An equivalent borehole shall have a nominal top diameter of no larger than ten inches for the first 50 feet, and a nominal bottom diameter of no larger than eight inches for the remaining 200 feet of pipe (average depth is 250 feet). Additionally, an equivalent borehole shall contain a contaminated layer no more than 20 feet long in the ten inch portion of the equivalent borehole. Individual methods shall be selected based on the likely level (concentration) of contaminants to be encountered. The most conservative drilling approach (lowest potential-to-emit) shall be applied first. Borehole logging shall be used to determine when it is appropriate to apply drilling techniques that may have a higher potential-to-emit. Zones not sampled during advancement of the borehole due to having a high potential to exceed exposure guidelines may be sampled by various side-wall sampling techniques as the boreholes are decommissioned.

Samples from air rotary type drilling shall be obtained from the "sampling sock" located on the side of the cyclone and/or from the drums underneath the cyclone and torit. The material in the drums will be sampled by pulling a mini-core from the drum. Sampling and change-out of the drums shall be performed inside the containment structure with continuous health physics technician (HPT) coverage.

Other possible borehole drilling techniques that may be used are limited to those described below:

- Sonic drilling
- Closed-end probe
- Traditional cable tool drilling from top to bottom
- Cone Penetrometer
- Geo Probe
- Auger drilling

Other soil sampling techniques will include one or a combination of the following techniques:

- Air Rotary Split Spoon
- Cable Tool
- Cable Tool and Auger with a Split Spoon Core Barrel
- Sonic Core Barrel and Split Spoon
- Rotary Coring
- Sidewall Sampling
- Drive Split-Spoon Sampler

Sidewall samples being brought to the surface will be bagged or sleeved into plastic or other suitable container (e.g. shielded container) after retrieval if decontamination or application of fixatives cannot reduce smearable contamination to less than 100,000 disintegrations per minute (dpm) per 100 cm² for beta/gamma or 2,000 dpm/100 cm² for alpha. The sampler will then be packaged in a container suitable for shipment to the laboratory for analysis. Other sidewall sampling techniques may involve a lever-action sampler (the sampler is driven into the formation through a cantilever action) or a rotating formation "shaving" device with the sample captured in an under-slung basket.

The brush, used to clean casings, shall be placed in plastic sleeving if decontamination or application of fixatives cannot reduce smearable contamination to less than 100,000 dpm/100 cm² for beta/gamma or 2,000 dpm/100 cm² for alpha when it is removed from the borehole. Pull the casing into plastic sleeving during removal if decontamination or application of fixatives cannot reduce smearable contamination to less than 100,000 dpm/100 cm² for beta/gamma or 2,000 dpm/100 cm² for alpha. Unthread the casing if possible, or cut using a wheel cutter, or disconnected from other segments into a nominal length of ten feet. A high-speed blade wheel cutter is not allowed. When necessary, either to accomplish casing removal for borehole decommissioning or to enable pull-back for sidewall sampling, the casing will be cut at depth using a Bowen casing cutter (or equivalent). If decontamination or application of fixatives cannot reduce smearable contamination to less than 100,000 dpm/100 cm² for beta/gamma or 2,000 dpm/100 cm² for alpha and the casing is sleeved in plastic, no more than one foot of casing shall be exposed to air during the cutting process. Capture cuttings in draped plastic. If decontamination or application of fixatives cannot reduce smearable contamination to less than 100,000 dpm/100 cm² for beta/gamma or 2,000 dpm/100 cm² for alpha, cap the pieces, cut with plastic or horsetail the sleeving and place sections in a burial box. The hole will be backfilled with clean (nonradioactive) materials (e.g., granular bentonite and/or grout). Casing removal activities are allowed to be performed outside of the containment structure. The closure of the equivalent boreholes may also be performed by backfilling the borehole using a tremie without pulling the casing.

Collect any perched water in the drum at the bottom of the cyclone. Approximately 1,000 gallons of purgewater is allowed to be removed from each equivalent borehole prior to inserting a screen below the water table. After installation of the screen, groundwater samples will be taken. An average of 2,000 gallons of water (which includes perched water, purgewater and groundwater sampling) is allowed to be removed from each equivalent borehole. Perched water and purgewater will be collected in passively ventilated open-top containers. Water shall be transferred from the passively ventilated containers into a tanker truck for treatment at the 200 Area Effluent Treatment Facility or other permitted storage/treatment facility. Water may be transferred directly from the borehole to the tanker truck, bypassing the intermediate containers.

Approximately 3,500 ft³ of soil may be excavated per year. Perform excavation using manual methods, backhoe, and/or the Guzzler.

- 4) The Annual Possession Quantity is limited to the following radionuclides (Curies/year):

Ac	227	2.02E-06
Am	241	1.55E-01
Am	243	3.45E-06
C-	14	9.47E-04
Cm	242	1.21E-03
Cm	243	4.22E-05
Cm	244	3.93E-04
Co	60	4.30E-03
Cs	134	6.58E-05
Cs	137	8.23E+00
Eu	152	1.84E-03
Eu	154	3.86E-02
Eu	155	1.16E-01
H-	3	3.42E-03
I-	129	7.64E-05
Ni	59	2.28E-03
Ni	63	2.22E-01
Np	237	1.58E-05
Pa	231	2.10E-06
Pu	238	9.77E-03
Pu	239	8.91E-01
Pu	240	9.40E-02
Pu	241	5.56E-01
Pu	242	2.66E-06
Ra	226	1.64E-07
Ra	228	8.52E-06
Ru	106	7.60E-06
Sb	125	3.23E-03
Sm	151	8.29E-01
Sn	126	3.54E-04
Sr	90	9.19E+01
Tc	99	1.58E-02
Th	229	3.45E-07
Th	232	3.38E-07
U-	232	2.61E-05
U-	233	1.00E-04
U-	234	1.98E-03
U-	235	8.76E-05
U-	236	2.02E-05
U-	238	2.00E-03
Y-	90	9.19E+01
Zr	93	1.07E-03

- 5) These Conditions and Limitations must be proceduralized prior to starting the activities described in the Notice of Construction.
- 6) This NOC becomes obsolete on July 15, 2019.

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- 7) The facility shall notify the department at least seven days prior to any planned preoperational testing of the emission unit's emissions control, monitoring or containment systems. The department reserves the right to observe such tests (WAC 246-247-060(4)).
- 8) The department retains the right to conduct its own stack sampling, environmental monitoring or other testing, as required around this unit to assure compliance. If the department so decides, the facility must make provision for such testing (WAC 246-247-075(10) and (11)).
- 9) The facility must be able to demonstrate the reliability and accuracy of emission data and other test results from this unit (WAC 246-247-075(13) and WAC 246-247-075(6)). The facility must be able to demonstrate that it has a quality assurance program compatible with applicable national standards listed in, or equivalent to, those listed in the above cited regulation.
- 10) If there is an unexpected release of radioactivity or if there is a shutdown or other condition that, if it were allowed to persist, would result in emissions of radionuclides in excess of any standards or limitations in the license or that lasts more than four hours, it must be reported to the department within 24 hours. Applicable standards (WAC 246-247-040) include unit specific emission limits, the offsite dose standard, BARCT or ALARACT, whichever is applicable, or any limitations included in this approval.
- 11) The department reserves the right to inspect and audit this unit during construction and operation, including all activities, equipment, operations, documents, data, and other records related to compliance with the regulations (WAC 246-247-080(1)).
- 12) The facility shall make requested documents available in a timely manner for review (WAC 246-247-080(10)).
- 13) **This condition was obsoleted on 2/25/02.** When this project is completed, or operations cease, the facility shall notify the department via a report of closure, including whether or not any potential for airborne release occur (WAC 246-247-080(6)).
Condition/Limitation added via AIR 00-515, November 17, 2000. Obsoleted to reflect current sunset language via AIR 02-211.
- 14) All measured or calculated emissions must be reported annually in the Hanford Site Air Emissions Report (WAC 246-247-080(3)).
- 15) All reports and records must be kept and reported according to 40 CFR 61, Subpart H (WAC 246-247-080(2)).
- 16) This unit must be fully accessible to Department of Health inspectors. If there are any specific training requirements or have restrictions or special requirements for entry, they must be given to the department when they are known to allow for unannounced inspections, as required by EPA (WAC 246-247-080(9)). At a minimum, for unannounced inspections, such requirements or restrictions must be told to inspectors that morning, with the opportunity for the inspectors to meet those requirements. For prior announced inspections, such notification must occur far enough in advance for the inspectors to have reasonable time to meet the requirements.
- 17) Records must be readily (promptly) available for this unit. Those records must be maintained onsite, and must be retained for at least five years (WAC 246-247-080(8)).
- 18) The facility must maintain a log in an approved format for this activity or emission unit (WAC 246-247-080(7)).
- 19) The department may require an ALARACT demonstration at any time (WAC 246-247-080(1)).
- 20) Emissions for these activities shall be tracked via a log approved by the department. This log shall track the hours of operation and location of use for each type of equipment, estimated and calculated curies

encountered, and calculated emissions. Air samples used for periodic confirmatory measurement shall be collected no closer than 3 ft above ground level. These samples shall be composited for each three individual sites (total of three samples) and analyzed at the completion of the borehole activity and casing removal. All periodic confirmatory samples will be collected and analyzed following EPA Method 114.

- 21) The facility must be able to demonstrate that the workers associated with this emission unit are adequately trained in the use and maintenance of emission control and monitoring systems, and in the performance of associated test and emergency response procedures (WAC 246-247-075(12)).
- 22) If the department finds that the emission unit described in this NOC is not in compliance with the standards in WAC 246-247-040 during construction or during operation the department reserves the right to require modifications to bring it into compliance (WAC 246-247-060(2)(d)).
- 23) Approval is given to use a downhole air hammer to drive a sampler while using a closed end probe.
- 24) Operation of the passive or active ventilation unit during the operation of the air hammer shall be documented on an approved log.
- 25) Emissions associated with the downhole air hammer will be routed to a passive or active ventilated HEPA filter. Pressure gauges will be installed on the emissions unit and will be monitored and recorded daily during operation of the downhole air hammer. Operation in the passive mode will not be allowed if the HEPA inlet pressure exceeds 20 inches water gauge and differential pressure exceeds 5.9 inches water gauge. Operation in the active ventilation mode will not be allowed if the HEPA inlet pressure exceeds 20 inches water gauge and differential pressure exceeds 5.9 inches water gauge. The flow shall not exceed the HEPA filter manufactures recommendation. Emissions from the drill rig shall be minimized using a double gasket seal and a chromed casing. This area shall be smear surveyed at the beginning and end of the work cycle and documented to determine adequacy of seal.
- 26) Periodic confirmatory sampling is required. For the air hammer method, instead of air sampling near the HEPA as described in the NOC, this shall consist of a destructive or non-destructive analysis of the HEPA filter combined with radiological field surveys during the work. The HEPA type filter located downstream of the process equipment shall have a minimum efficiency of 99.95 percent for particulates with a median diameter of 0.3 microns as specified by the manufacturer. The radiological analyses from the soil samples will be averaged to determine the isotopic distribution of Strontium-90 (Sr-90), Cs-137, Plutonium-239 (Pu-239), and Americium (Am-241). The record filter will be counted using a gamma spectrometer calibrated to Cs-137. Counting will be done annually using either a destructive or non-destructive technique.
- 27) The emission unit shall be inspected daily during operation and after any relocations. Line pressure tests will be performed on the line between the well head and the filter and/or fan prior to deploying the air hammer. Line pressure tests will be performed in accordance with ASME/ANSI N510.
- 28) For various characterization options covered under this NOC, the maximum TEDE to the hypothetical off site MEI shall not exceed $7.03 \text{ E-02 mrem/year}$. The maximum TEDE to the MEI shall not exceed $5.7 \text{ E-02 mrem/year}$ at the Energy Northwest location as determined by CAP88PC, Version 2 supplied as supporting documentation.
- 29) APQ associated with the air hammer operation shall not exceed 195 curies. This shall be tracked and documented on an approved log and subtracted from the APQ listed for the emissions associated with diffuse and fugitive emissions.
- 30) Prior to permanent shut down of an emission unit or completion of an activity, the permittee shall file a report of closure with the Department of Health. The report of closure shall include the date of the shutdown and indicate whether, despite cessation of operation, there is still a potential for radioactive air emissions and a need for any active or passive ventilation system with emission control and/or

monitoring devices. An emission unit or activity will not be considered permanently shut down or completed until a report of closure is received and approved by Health.

Once an emission unit is permanently shut down or an activity is completed, thereby rendering existing permit terms and conditions irrelevant, the permittee shall not be required, after the shutdown or completion, to meet any monitoring, record keeping, and reporting, requirements which are no longer applicable for that emission unit or activity.

All records, relating to the shut down emission unit or completion of an activity, generated while the emission unit or activity was in operation, shall be kept in accordance with WAC 246-247-080 (8).
(WAC 246-247-080 (6))